Qubino

The **INNOVATIVE** and **SMALLEST**

# Flush shutter DC

| ORDERING CODE | Z-WAVE FREQUENCY |
|---|---|
| ZMNHOD1 | 868,4 MHz |
| ZMNHOD2 | 921,4 MHz |
| ZMNHOD3 | 908,4 MHz |
| ZMNHOD4 | 869,0 MHz |
| ZMNHOD5 | 916,0 MHz |

This Z-Wave module is used to control the motor of blinds, rollers, shades, garage doors, gates, venetian blinds, etc.. The module can be controlled either through a Z-Wave network or through the wall switch.

Precise positioning is supported for motors equipped with mechanical or electronic end switches. The module is designed to be mounted inside a “flush mounting box”, hidden behind a traditional wall switch. Module measures power consumption of motor and support connection of digital temperature sensor. It is designed to act as repeater in order to improve range and stability of Z-wave network.

## Supported switches

Module supports **mono-stable** switches (push button) and **bi-stable** switches.

## Installation

- Before the installation disconnect power supply.
- Connect the module according to electrical diagram.
- Locate the antenna far from metal elements (as far as possible).
- Do not shorten the antenna.

## Danger of electrocution!

- Module installation requires a great degree of skill and may be performed only by a qualified and licensed electrician.
- Even when the module is turned off, voltage may be present on its terminals. Any works on configuration changes related to connection mode or load must be always performed by disconnected power supply (disable the fuse).

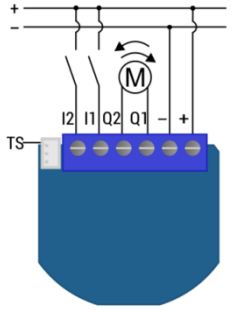
## Note!

Do not connect the module to loads exceeding recommended values. Connect the module only in accordance to the below diagrams. Improper connections may be dangerous.

## Package contents

- Flush shutter DC

## Electrical diagram 12 - 24VDC




**Notes for the diagram:**

| | |
|---|---|
| **+** | +VDC (12 – 24VDC) |
| **-** | -VDC (0V) |
| **Q1** | Output for motor UP (open) |
| **Q2** | Output for motor DOWN (close) |
| **I2** | Input for switch/push button DOWN (close) |
| **I1** | Input for switch/push button UP (open) |
| **TS** | Terminal for digital temperature sensor (only for Flush shutter DC module compatible digital temperature sensor, which must be ordered separately). |

**S** Service button (used to add or remove module from the Z-Wave network).

## Module Inclusion (Adding to Z-wave network)

- Connect module to power supply (with temperature sensor connected - if purchased),
- bring module within maximum 1 meter (3 feet) of the main controller,
- enable add/remove mode on main controller,
- auto-inclusion (30 minutes after connected to power supply) or
- press service button **S** for more than 2 second or
- press push button **I1** three times within 3s (3 times change switch state within 3 seconds)

NOTE:

When connecting temperature sensor to module that has already been included, you have to exclude module first. Connect the sensor and re-include the module.

## Module Exclusion/Reset (Removing from Z-Wave network)

- Connect module to power supply
- bring module within maximum 1 meter (3 feet) of the main controller,
- enable add/remove mode on main controller,
- press service button **S** for more than 6 second or
- press push button **I1** five times within 3s (5 times change switch state within 3 seconds) in the first 60 seconds after the module is connected to the power supply.

By this function all parameters of the module are set to default values and own ID is deleted.

If service button S is pressed more than 2 and less than 6 second module is excluded, but configuration parameters are not set to default values.

## Association

Association enables Flush shutter DC module to transfer commands inside Z-wave network directly (without main controller) to other Z-Wave modules.

**Associated Groups**:

Group 1: default reporting group (reserved for the main controller).

Group 2: basic on/off (triggered at change of the input I1 state and reflecting its state) up to 16 nodes.

Group 3: basic on/off (triggered at change of the input I2 state and reflecting its state) up to 16 nodes.

Group 4: multilevel (triggered at changes of value of the Flush shutter DC position) up to 16 nodes.

Group 5: multilevel (triggered at changes of value of slats tilting position) up to 16 nodes.

## Automatic calibration

Automatic calibration is a process during which the Flush shutter DC learns the position of the limit switches.

### Shutter positioning calibration

(par. 71 set to 1)

There are two procedures of calibration.

**Calibration through main controller UI**

1) Include the module into the Z-wave network, according to module include instructions.
2) Set the parameter 78 (Forced Flush shutter DC calibration) value to 1.
3) Flush shutter DC performs the calibration process, completing full cycle - up, down and up again.
4) Set the parameter 78 (Forced Flush shutter DC calibration) value to 0.

### Calibration through the inputs I1 and I2

1) Include the module into the wireless network, according to module inclusion instructions.
2) Quick press the switch/push-button connected to I1 input and wait until the shutter reach upper limit switch.
3) Quick press the switch/push-button connected to I2 input and wait until the shutter reach lower limit switch.
4) Quick press the switch/push-button connected to I1 input and wait until the shutter reach upper limit switch.

### Slates tilting position calibration

(par. 71 set to 1)

When enabling venetian blind mode, position calibration for slats titling calibration must be done. After that, blind position and angle of slates can be set. By default full turn for slates is set to 1,5s. This value can be changed according to slates types and time by value in parameter 72.

1) Include and make module calibration according to section ‘Shutter positioning calibration’.
2) Set parameter 71 to 1 ‘Venetian blinds’.
3) Reconfigure node using main controller.
4) After module reconfiguration below main shutter widget, another widget for slates control will appear on UI.
5) By default full turn movement is set to 1,5s. If this time is too long (if after slates full cycle shutter starts moving up or down), decrease this time defined with parameter 72.

## Manual operation for shutter

(par. 71 set to 0)

Module allows connecting of push-buttons (mono-stable) or switches (bi-stable) to I1 and I2 terminals.

Clicking push-button (<2s) connected to I1 (up), initiates up movement.

Clicking push-button (<2s) connected to I2 (down), initiates down movement.

If the shutter is moving, each click, of any push-button, will stop the movement.

Keeping pressed push-button (>2s) connected to I1 (up), initiates up movement, until push-button is released.

Keeping pressed push-button (>2s) connected to I2 (down), initiates down movement, until push-button is released.

## Manual operation for venetian blinds

(par. 71 set to 1)

### Slates on start position - 0 degree

Clicking push-button (for time < full turn slates time-par.72) connected to I1 (up), initiates slates turning towards end - 180 degree position, until push-button is released.

Clicking push-button (for time < full turn slates time-par.72) connected to I2 (down), initiates shutter down movement.

If the shutter is moving, each click, of any push-button, will stop the movement.

Keeping pressed push-button (for time > full turn slates time-par.72) connected to I1 (up), initiates full slates turn and up movement, until the push-button is released.

Keeping pressed push-button (for time > full turn slates time-par.72) connected to I2 (down), initiates shutter down movement, until the push-button is released.

### Slates on end position - 180 degree

Clicking push-button (for time < full turn slates time-par.72) connected to I1 (up), initiates shutter up movement.

Clicking push-button (for time < full turn slates time-par.72) connected to I2 (down), initiates slates turning towards start - 0 degree position, until the push-button is released.

If the shutter is moving, each click, of any push-button, will stop the movement.

Keeping pressed push-button (for time > full turn slates time-par.72) connected to I1 (up), initiates shutter up movement, until the push-button is released.

Keeping pressed push-button (for time > full turn slates time-par.72) connected to I2 (down), initiates full slates turn and down movement, until the push-button is released.

## Configuration parameters

**Parameter no. 10 - Activate/deactivate functions ALL ON / ALL OFF**

Available configuration parameters (data type is 2 Byte DEC):

- default value 255
- 255 - ALL ON active, ALL OFF active.
- 0 - ALL ON is not active, ALL OFF is not active
- 1 - ALL ON is not active ALL OFF active
- 2 - ALL ON is not active ALL OFF is not active

Module responds to commands ALL ON / ALL OFF that may be sent by the main controller or by other controller belonging to the system.

**Parameter no. 40 - Power reporting in Watts on power change for Q1 or Q2**

Set value means percentage, set value from 0 – 100 = 0% - 100%. Available configuration parameters (data type is 1 Byte DEC):

- default value 1
- 0 – reporting disabled
- 1 – 100 = 1% - 100% Reporting enabled. Power report is send (push) only when actual power (in Watts) in real time changes for more than set

percentage comparing to previous actual power in Watts, step is 1%.

NOTE: if power changed is less than 1W, the report is not send (pushed), independent of percentage set.

**Parameter no. 42 – Power reporting in Watts by time interval for Q1 or Q2**

Set value means time interval (0 – 32767) in seconds, when power report is send. Available configuration parameters (data type is 2 Byte DEC):

- default value 300 = 300s
- 0 – Reporting Disabled
- 1 – 32767 = 1 second – 32767 seconds. Reporting enabled, power report is send with time interval set by entered value.

**Parameter no. 71 – Operating modes**

This parameter defines selection between two available operating modes. Available configuration parameters (data type is 1 Byte DEC):

- default value 0
- 0 – Shutter mode
- 1 – Venetian mode (up/down and slate rotation)

NOTE: When setting parameter, module needs to be reconfigured! Please check detailed description in this manual.

**Parameter no. 72 – Slats tilting full turn time**

This parameter defines the time necessary for slats to make full turn (180 degrees). Available configuration parameters (data type is 2 Byte DEC):

- default value 150 = 1,5 seconds
- 0 – Tilting time disabled
- 1 – 32767 = 0,01seconds – 327,67 seconds

NOTE: If time set is too high, this will result that after full turn, shutter will start move up or down, for time remaining.

**Parameter no. 73 – Slats position**

This parameter defines slats position after up/down movement through UI or push-buttons. Available configuration parameters (data type is 1 Byte DEC):

- default value 2
- 0 - Slats return to previously set position only in case of UI control.
- 1 - Slats return to previously set position in case of UI control, push-button operation, or when the limit switch is reached.
- 2 - Slats return to previously set position in case of UI control, push-button operation, when the limit switch is reached or after receiving a “STOP” control frame (Switch Multilevel Stop Level Change) from UI.

**Parameter no. 74 – Motor moving up/down time**

This parameter defines shutter motor moving time of complete opening or complete closing. Available configuration parameters (data type is 2 Byte DEC):

- default value 0
- 0 – moving time disabled (working with limit switches)
- 1 – 32767 = 0,1seconds – 3276,7seconds. After that time motor is stopped (relay goes to off state)

NOTE: Important is that the reference position to manually set moving time is always shutter lower position!

Set parameter 74 to 0 and move the shutter (using up/down push buttons or main controller UI) to desired lower position. On this shutter position, set parameter 74 to time for complete opening or complete closing. At this point shutter can be moved up (open) for set time, but can't be moved down because this position is already set as lower shutter position.

To change shutter lower position below already set (manual recalibration), parameter 74 must be set to 0 and repeat the procedure described above.

In case shutter has limit switches, but anyhow you would like to limit opening/closing position by time, you can still do it. In case you put time that is longer that opening/closing real time limited by limit switches, shutter will stop at limit switch, but the module relay will switch off after define time, not by shutter limit switch. Take in consideration that in this condition, the positioning with slider through UI will not show correct shutter position.

**Parameter no. 76 - Motor operation detection**

Power threshold to be interpreted when motor reach the limit switch. Available configuration parameters (data type is 1 Byte DEC):

- default value 6 = 0,6W
- Available settings: 5 - 100 (0,5W - 10W), step is 0,1W. The value 0 means reaching a limit switch will not be detected

**Parameter no. 78 - Forced Shutter calibration**

By modifying the parameters setting from 0 to 1 a Shutter enters the calibration mode. Available configuration parameters (data type is 1 Byte DEC):

- default value 0
- 1 - Start calibration process (after shutter performs the calibration process, completing full cycle - up, down and up, set the parameter 78 (Forced Shutter calibration) value back to 0.

**Parameter no. 80 – Reporting to controller**

This parameter defines if reporting regarding power level, multilevel, etc.., is reported to controller or not. Available configuration parameters (data type is 1 Byte DEC):

- default value 1
- 0 reporting to controller is disabled
- 1 reporting to controller is enabled

NOTE: Disabling reporting is recommended in case Z-wave modules communicate in association groups without using controller.

**Parameter no. 85 – Power consumption max delay time**

This parameter defines the max time before motor power consumption is read after one of the relays is switched ON. If there is no power consumption during this max time (motor not connected, damaged or requires higher time to start, motor in end position,...) the relay will switch OFF. Time is defined by entering it manually. Available configuration parameters (data type is 1 Byte DEC):

- default value 8 = 800ms
- 3 – 50 = 0,3seconds – 5seconds (100ms resolution)

**Parameter no. 86 – Power consumption at limit switch delay time**

This parameter defines the max time at limit switch, when power consumption is below power threshold. If the power consumption during this time is below power threshold (par. 76), the active output will switch off, means that limit switch is reached. Available configuration parameters (data type is 1 Byte DEC):

- default value 8 = 800ms
- 3 – 50 = 0,3seconds – 5seconds (100ms resolution)

**Parameter no. 90 – Delay time between outputs**

This parameter defines the time delay between output switching (time between switching up/down and vice versa). Available configuration parameters (data type is 1 Byte DEC):

- default value 5 = 500ms
- 1 – 30 = 0,1seconds – 3seconds (100ms resolution)

**Parameter no. 110 – Temperature sensor offset settings**

Set value is added or subtracted to actual measured value by sensor. Available configuration parameters (data type is 2 Byte DEC):

- default value 32536
- 32536 – offset is 0.0C
- From 1 to 100 – value from 0.1 °C to 10.0 °C is added to actual measured temperature.
- From 1001 to 1100 – value from -0.1 °C to -10.0 °C is subtracted to actual measured temperature.

**Parameter no. 120 – Digital temperature sensor reporting**

If digital temperature sensor is connected, module reports measured temperature on temperature change defined by this parameter. Available configuration parameters (data type is 1 Byte DEC):

- Default value 5 = 0,5°C
- 0 – Reporting disabled
- 1-127 = 0,1°C – 12,7°C, step is 0,1°C

## Technical Specifications

| | |
|---|---|
| Power supply | 12-24VDC +/-10% |
| Rated load current | 2A |
| Overcorrect protection | 5A |
| Output circuit power of DC output (resistive load) | 48W (24VDC) |
| Power measurement accuracy | +/-5% |
| Digital temperature sensor range (sensor must be ordered separately) | -50 ~ +125°C |
| Operation temperature | -10 ~ +40°C |
| Distance | up to 30 m indoors (depending on building materials) |
| Dimensions (WxHxD) (package) | 41,8x36,8x15,4mm (79x52x22) |
| Weight (Brutto with package) | 28g (34g) |
| Electricity consumption | cca. 0,3W |
| For installation in boxes | Ø ≥ 60mm or 2M |
| Switching | H bridge |

### Z-Wave Device Class:

BASIC_TYPE_ROUTING_SLAVE
GENERIC_TYPE_SWITCH_MULTILEVEL
SPECIFIC_TYPE_CLASS_B_MOTOR_CONTROL

### Z-Wave Supported Command Classes:

COMMAND_CLASS_SWITCH_MULTILEVEL_V3
COMMAND_CLASS_BASIC
COMMAND_CLASS_SWITCH_MULTILEVEL_V3
COMMAND_CLASS_SWITCH_ALL
COMMAND_CLASS_SWITCH_BINARY
COMMAND_CLASS_METER_V3
COMMAND_CLASS_SENSOR_MULTILEVEL_V3
COMMAND_CLASS_POWERLEVEL
COMMAND_CLASS_ASSOCIATION
COMMAND_CLASS_CONFIGURATION
COMMAND_CLASS_MANUFACTURER_SPECIFIC
COMMAND_CLASS_VERSION
COMMAND_CLASS_MARK
COMMAND_CLASS_BASIC

### Endpoint1:

COMMAND_CLASS_SWITCH_MULTILEVEL_V3
COMMAND_CLASS_BASIC
COMMAND_CLASS_SWITCH_MULTILEVEL_V3
COMMAND_CLASS_SWITCH_ALL
COMMAND_CLASS_SWITCH_BINARY
COMMAND_CLASS_METER_V3
COMMAND_CLASS_SENSOR_MULTILEVEL_V3
COMMAND_CLASS_POWERLEVEL
COMMAND_CLASS_ASSOCIATION
COMMAND_CLASS_CONFIGURATION
COMMAND_CLASS_MANUFACTURER_SPECIFIC
COMMAND_CLASS_VERSION
COMMAND_CLASS_MARK
COMMAND_CLASS_BASIC

This product can be included and operated in any Z-Wave network with other Z-Wave certified devices from any other manufacturers. All constantly powered nodes in the same network will act as repeaters regardless of the vendor in order to increase reliability of the network.

## Important disclaimer

Z-wave wireless communication is inherently not always 100% reliable, and as such, this product should not be used in situations in which life and/or valuables are solely dependent on its function.

## Warning!

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.
Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being. When replacing old appliances with new once, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.

This user manual is subject to change and improvement without notice.

**NOTE**:
User manual is valid for module with SW version S1 (SW version is part of P/N)!
Example: P/N: ZMNHODx H1**S1**P1

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